



US005596564A

**United States Patent** [19]

Fukushima et al.

[11] **Patent Number:** 5,596,564[45] **Date of Patent:** Jan. 21, 1997**[54] INFORMATION RECORDING MEDIUM AND APPARATUS AND METHOD FOR RECORDING AND REPRODUCING INFORMATION**

[75] Inventors: Yoshihisa Fukushima; Masahiro Inagaki, both of Osaka; Yasushi Azumatani, Takatsuki; Hiroshi Hamasaka, Hirakata, all of Japan

[73] Assignee: Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

[21] Appl. No.: 319,680

[22] Filed: Oct. 7, 1994

**[30] Foreign Application Priority Data**

Oct. 8, 1993 [JP] Japan ..... 5-252854

[51] Int. Cl.<sup>6</sup> ..... G11B 7/00

[52] U.S. Cl. .... 369/275.3; 369/48; 369/58; 360/33.1; 360/39

[58] Field of Search ..... 369/56, 53, 54, 369/58, 59, 60, 47, 48, 49, 124, 32; 360/33.1, 32, 48, 39, 40, 44

**[56] References Cited****U.S. PATENT DOCUMENTS**

5,111,444 5/1992 Fukushima et al. .  
5,138,599 8/1992 Fukushima et al. .

5,140,437 8/1992 Yonemitsu et al. .... 360/32  
5,270,877 12/1993 Fukushima et al. .  
5,455,684 10/1995 Fujinami et al. .... 360/33.1 X

**FOREIGN PATENT DOCUMENTS**

2-72780 3/1990 Japan .  
5-20369 1/1993 Japan .

Primary Examiner—Muhammad N. Edun  
Attorney, Agent, or Firm—Ratner & Prestia

**[57] ABSTRACT**

The data recording/reproducing apparatus of the present invention efficiently performs a trickplay mode operation such as fast forward reproducing and rewind reproducing and a postrecording operation by using a data recording medium storing a variable-bitrate-compressed video data. Each AV file in the video data includes chapter data and first and second pointer data. Each GOP data in the chapter data includes one independent picture data and a plurality of dependent picture data. The first pointer data includes the location data of the independent picture data, and the second pointer data includes the location data of the first pointer data. Further, each GOP data includes an audio data interleaved with the picture data. The first pointer data includes the location data of the corresponding audio data, and the second pointer data includes the location data of the corresponding first pointer data. A hierarchical location data for retrieving the independent picture data and/or the audio data is formed by the first and second pointers.

**11 Claims, 13 Drawing Sheets**